

README FOR STEREO PLASTIC ALFVÉN WAVE LIST

Last update: February 21, 2017 (WY, CF, LE)

Data Usage:

Data provided by the PLASTIC team at the University of New Hampshire is under NASA grant NNX15AU01G.

Alfvén wave data provided here is courtesy of W. Yu and C. Farrugia.

The table lists some Alfvén waves observed by the STEREO spacecraft from year 2007 to year 2014. They are identified while searching for small solar wind transients (STs).

STs were observed frequently in the solar wind (Yu et al., 2014, 2016). However, as pointed out by Marubashi et al. [2010] and Cartwright and Moldwin [2010], some solar wind Alfvénic structures can be mistaken for STs. For this reason, we need to identify Alfvénic structures. We classify as Alfvénic fluctuations those structures which satisfy the relation $\Delta V_{\perp} = \frac{\Delta B_{\perp}}{\sqrt{\mu_0 \rho}}$. Here ΔV_{\perp} and ΔB_{\perp} represent the velocity and magnetic field perturbations perpendicular to the background field. The latter is obtained by smoothing. (R_x, R_y, R_z) are three correlation coefficients between ΔB_{\perp} and $\Delta A_{\perp} = \sqrt{\mu_0 \rho} * \Delta V_{\perp}$. We used CORRELATE function in IDL to get the three correlations between ΔB_{\perp} and ΔA_{\perp} (an example picture has been attached, see Figure 1).

We require all three correlations (R_x, R_y, R_z) to be greater than 0.5, or two greater than 0.6 and the other greater than 0.3, which is similar to the criterion in Cartwright and Moldwin [2008].

These data are delivered to the public domain on a regular basis. Efforts are made to include the latest known calibration and background determinations, however, these are expected to undergo revision. We therefore suggest that users regularly return to this page, and make sure to get the most recent revision.

If used in presentations or publications:

We strongly suggest that Dr. Wenyuan Yu (unhyuan@gmail.com) and Dr. Charlie Farrugia (charlie.farrugia@unh.edu) be contacted to ensure that you are working with the latest release.

Please acknowledge STEREO PLASTIC Investigation (A.B. Galvin, PI) and NASA grant NNX15AU01G.

For reporting purposes, we request bibliography information for any publication, etc., using these data. Please send information on the use of this data to the PLASTIC PI:

Dr. A.B. Galvin
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If you have questions regarding the data formats, please contact the PLASTIC Data System Manager:

Dr. Lorna Ellis
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File Naming convention:

STx_L3_PLA_AlfWaves_Vyy.txt

Where:

"STx" is given as "STA" or "STB" for STEREO A and STEREO B, respectively.

"L3" indicates Level 3 data in the STEREO PLASTIC convention.

"PLA" indicates Plasma and Suprathermal Ion Composition (PLASTIC) Investigation.

"AlfWaves" indicates the Alfvén waves data product.

"Vyy", indicates Version number, with the processing version given by the "yy."

"pdf" indicates a portable document file.

Explanation of Columns in Alfvén Wave List

Column 1 – Event number

Column 2 – Start Time

Column 3 – End Time

Column 4 – Rx coefficient

Column 5 – Ry coefficient

Column 6 – Rz coefficient

STA 20071019/23:50:00 – 20071020/04:40:00

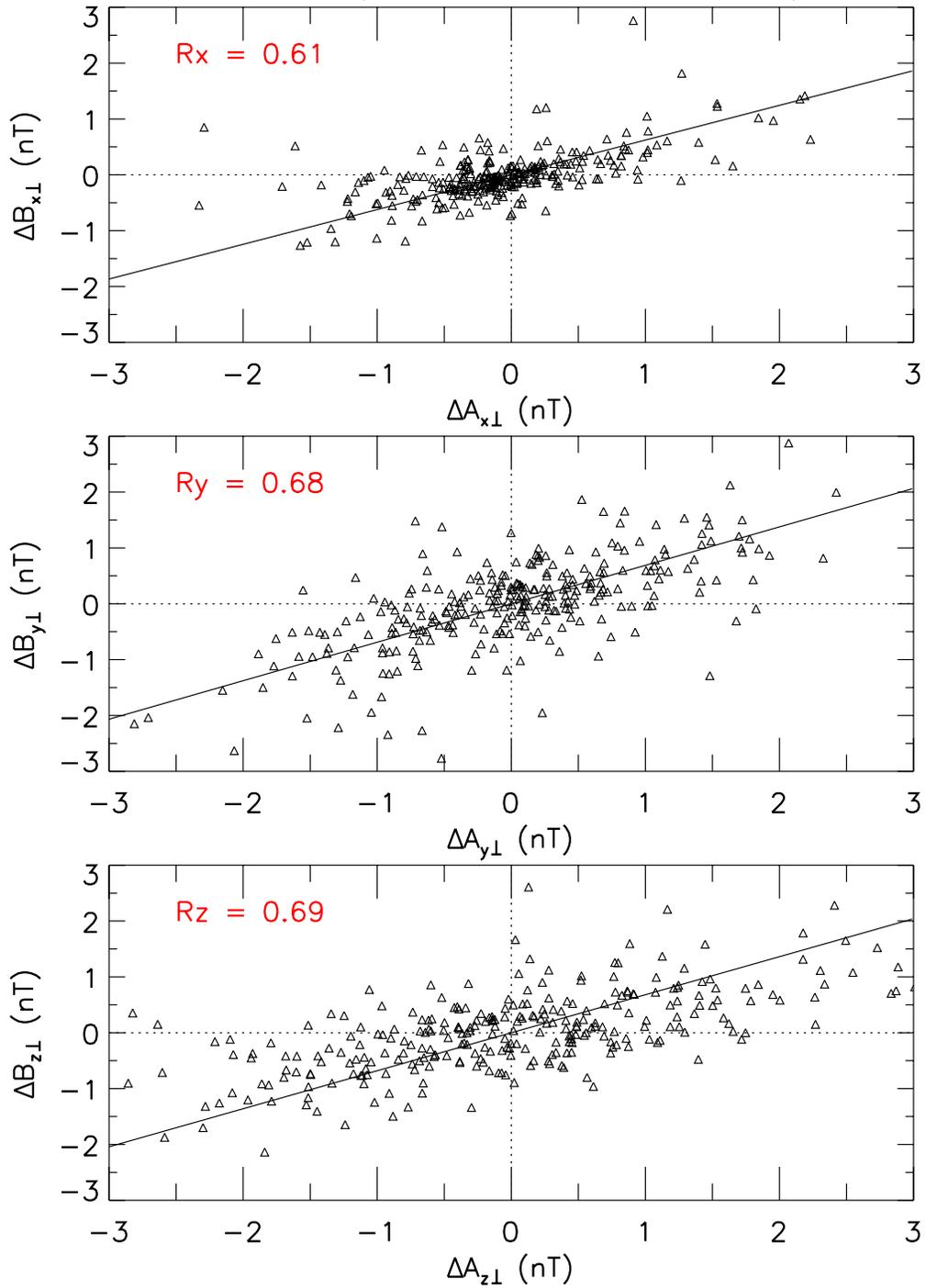


Figure 1: The clear correlations between ΔB_{\perp} and ΔA_{\perp} in an Alfvénic structure.

References:

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